

## Chapter 2

### Are You Scientifically Literate? Why We Teach Science

#### Multiple Choice

1. You read an article in *Soy Joy* magazine in which the authors recommend that all humans ingest soy every day to extend life expectancy. Which action would not help you determine the credibility of the article?
  - a. Investigate the authors and their other publications.
  - b. Google “sources of joy”
  - c. Locate additional research studies on soy.
  - d. Research how to increase life expectancy.

Answer: b

2. The ability to judge the evidences and findings of research for oneself is referred to as:
  - a. intellectual independence.
  - b. cognitive dissonance.
  - c. scientific acumen.
  - d. considerate exploration.

Answer: a

3. According to the authors, the ultimate goal for all science students should be:
  - a. information gathering.
  - b. scientific literacy.
  - c. memorization of the periodic table.
  - d. an understanding of the natural world.

Answer: b

4. The majority of individuals who choose science, technology, engineering, or mathematics careers are:
  - a. Asian males.
  - b. Black females.
  - c. Asian females.
  - d. White males.

Answer: d

5. Which event prompted an increase in U.S. funding for schools to enhance math and science?
- a. The publication of Charles Darwin's book *On the Origin of Species* in 1859
  - b. The Space Shuttle Challenger disaster in 1986
  - c. The reauthorization of No Child Left Behind in 2001
  - d. The Soviet Union's launch of Sputnik in 1957

Answer: d

6. Which of the following subjects was not part of the traditional core curriculum?
- a. Writing
  - b. Science
  - c. Reading
  - d. Arithmetic

Answer: b

7. The National Commission on Excellence in Education recommended that science students be taught all of the following except:
- a. natural selection.
  - b. the process of science.
  - c. methods of scientific inquiry.
  - d. application of science to daily life.

Answer: a

8. What is the name of the massive, long-term reform effort designed to promote scientific literacy in the U.S. by the year 2061?
- a. Halley's Comet
  - b. Project 2061
  - c. TIMSS
  - d. Educating Americans for the 21<sup>st</sup> Century

Answer: b

9. What was the greatest national concern while the National Commission on Excellence in Education was conducting its work?
- a. International competitiveness
  - b. Terrorism
  - c. Crime
  - d. Soaring rates of school truancy

Answer: a

10. All of the following are aspects of the NSES standards except:

- a. prescription for a national curriculum.
- b. appropriate science content for K-12 science practices.
- c. the vision of science for all students.
- d. defining scientific literacy.

Answer: a

11. The NSES standards are organized around grade-level bands. Which of the following is not one of these bands?

- a. K-4
- b. K-1
- c. 5-8
- d. 9-12

Answer: b

12. Ideas that describe the often multifaceted relationships among related concepts are called:

- a. facts.
- b. concepts.
- c. principles.
- d. notions.

Answer: c

13. The NSES grade-level content strands are designed to promote the \_\_\_\_\_ of learning science content.

- a. transference
- b. scaffolding
- c. evolution
- d. independence

Answer: b

14. All of the following are listed on the NSES website as an important reason for scientific literacy except:

- a. personal fulfillment and excitement.
- b. the need for good judgment regarding shared resources such as air, water, and forests.

- c. support of higher salaries for science teachers.
- d. the increasing need for informed decision making about scientific information.

Answer: c

15. Knowledge that washing dishes with soap and hot water is better in removing grease is an example of:

- a. scientific literacy.
- b. lunacy.
- c. environmental ignorance.
- d. abstract thinking.

Answer: a

16. Scientifically literate students who do not choose science as a career may still impact the world by:

- a. facilitating support groups for those who are not scientifically literate.
- b. participating in an informed way on issues related to science.
- c. choosing only scientifically-based reading material.
- d. teaching others about the adverse effects of aspartame.

Answer: b

17. Discrete information substantiated through evidence is called a(n):

- a. concept.
- b. idea.
- c. variable.
- d. fact.

Answer: d

18. Scientific literacy is not:

- a. knowledge and understanding of scientific concepts.
- b. processes required for personal decision making and participation in civic and cultural affairs.
- c. reading and believing investigations and scientific reports at face value.
- d. using available resources to research information for decision making.

Answer: c

19. The NSES view students as \_\_\_\_\_ learners who are \_\_\_\_\_ about the world.

- a. gifted; already knowledgeable

- b. active; curious
- c. monastic; uninformed
- d. blank slate; ignorant

Answer: b

20. The ideas or processes that connect scientific ideas across the disciplines are called:

- a. unifying concepts.
- b. holistic thoughts.
- c. consistent hypotheses.
- d. effective criteria.

Answer: a

### True or False

1. *Benchmarks for Scientific Literacy* was created as a national standards document.  
False

2. Facts are ideas that describe the multifaceted relationships among concepts.  
Answer: False

3. The NSES content strands are identified by grade-level bands.  
True

4. A crucial aspect of a theory is that it is constant and unchanging.  
Answer: False

5. According to the authors, science is an interactive and social endeavor.  
Answer: True

6. Most educators agree that scientific literacy is ideally a short-term, discrete process.

Answer: False

7. In order to be scientifically literate, it is important that students learn to conform their ideas to majority opinion.

Answer: False

8. The publication, *Science for All Americans*, includes grade-level learning standards.

Answer: False

### Short Answer and Essay

1. Why is it important to understand how past reform initiatives and policies influence the state of science education today?
2. Provide an example in which one applies scientific knowledge to a typical daily routine.
3. Define a principle, concept, and fact. Provide an example of each.
4. List and describe the two documents that have been instrumental in moving science education to where we are today.
5. Describe how the goal of scientific literacy can encourage minority involvement in the sciences.